• Fair-LR Python Model: create a fairness-enhanced logistic regression (Fair-LR) model of prediction based on Seldonian Framework. Fair-LR allows researchers to define their own fairness evaluation metrics, utilize existing popular fairness metrics, and incorporate these metrics into model learning to learn to be fairer. Fair-LR has demonstrated capabilities to achieve both fair and accurate predictions.

<https://github.com/uf-aice-lab/fair-prediction>

• Fair-NE Python Model: construct a fair peer recommender using network embeddings. Fair-NE allows researchers to debias the peer recommender system by specifying multiple categorical demographic variables such as nationality, gender, and race. The model learns to adjust its internal embedding system to recommend peers without being influenced by students’ demographics. Fair-NE adopts a Bayesian approach for building recommender systems with dynamic update to provide fair and accurate insights.

<https://github.com/uf-aice-lab/fair-peer-recommender>

• MathRoBERTa: a transformer-based model, which has been trained with 8 Nvidia GPUs and over 3,000,000 math discussion posts by students and facilitators on Algebra Nation. MathRoBERTa has 24 layers, and 355 million parameters and its published model weights take up to 1.5 gigabytes of disk space. Researchers can easily download and utilize this model to conduct a series of natural language processing tasks (e.g., text classification, semantic search, Q&A) in similar math learning environments.

<https://huggingface.co/uf-aice-lab/math-roberta>

• SafeMathBot: build a transformer model using state-of-the-art language GPT-2 which has been trained with 8 Nvidia GPUs and enhanced with conversation safety policies (e.g., threat, profanity, identity attack) using 3,000,000 math discussion posts by students and facilitators on Algebra Nation. SafeMathBot consists of 48 layers and over 1.5 billion parameters, consuming up to 6 gigabytes of disk space. Researchers can experiment with and finetune the model to help construct math conversational AI that can effectively avoid unsafe response generation.

<https://huggingface.co/uf-aice-lab/SafeMathBot>